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## 2022 Colorado Science and Engineering Fair Award Winners

This year's Colorado Science and Engineering Fair (CSEF) was held April 7-8, 2022. 215 projects were on display from students in grades 6 through 12, at the Lory Student Center on the Colorado State University – Fort Collins campus.

This year, roughly 350 individual Grand and Special Awards were handed out. Attached is the list of winners from the Boulder Valley Corden Pharma Regional.

### 2022 Colorado Science and Engineering Fair Grand Awards Press Release

<p><b><u>Junior Division Best of CSEF Projects</u></b></p> <p>Third Place        Sophia Zhang 8th grade        A Small Bond Breaking Breaks Boundaries Toward the Solution to Plastic Pollution        Summit Middle Charter School Boulder</p> <p><b><u>Senior Division Best of CSEF Projects</u></b></p> <p>Fourth Place        Natalie Pujet 11th grade        Modeling Triton's Seasonal Atmospheric Change: Applications of the VT3D Model to Triton        Fairview High School Boulder</p> <p>Fifth Place        Henry Westfall 11th grade        Investigating Political Polarization Through Human Experiments and Agent-Based Simulation        Fairview High School Boulder</p>	<p><b><u>Junior Division Animal Sciences</u></b></p> <p>Third Place        Mandy Roth 6th grade        Does Jumping Higher Result in a Dog Landing with More Force?        Flagstaff Academy Longmont</p> <p><b><u>Junior Division Behavioral &amp; Social Sciences</u></b></p> <p>First Place        Julia Ropp 8th grade        The Power of Positivity        Summit Middle Charter School Boulder</p> <p><b><u>Senior Division Behavioral &amp; Social Sciences</u></b></p> <p>First Place        Henry Westfall 11th grade        Investigating Political Polarization Through Human Experiments and Agent-Based Simulation        Fairview High School Boulder</p>
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### **Senior Division Chemistry & Biochemistry**

First Place

Anastasia Diener 11th grade  
Sequentially Photo Stiffening a Hydrogel: Redshifting  
Tetrazoles for Long-Wavelength Activation  
Fairview High School Boulder

### **Junior Division Energy**

Second Place

Saatwik Das 8th grade  
Magnetic Levitation  
Peak to Peak Charter School Lafayette

### **Senior Division Energy**

Honorable Mention

Alec Mallinger 12th grade  
Oliver Schmitz 12th grade  
Davis Cutforth 12th grade  
Hydrogen Fuel Cell Vehicle/Station  
Centaurus High School Lafayette

### **Junior Division Environmental Sciences**

First Place

Sophia Zhang 8th grade  
A Small Bond Breaking Breaks Boundaries Toward the  
Solution to Plastic Pollution  
Summit Middle Charter School Boulder

### **Senior Division Environmental Sciences**

Second Place

Elton Cao 10th grade  
The Effect of Oil and Gas Production on Tropospheric  
Ozone and Air Quality Emissions  
Fairview High School Boulder

Third Place

Amrita Saini 10th grade  
Using Algae to Make Photosynthetic & Bioluminescent  
Textiles for Sustainable Lighting & CO<sub>2</sub> Removal  
Peak to Peak Charter School Lafayette

### **Junior Division Medicine & Health**

First Place

Lila Mosberger 8th grade  
How Ethanol Affects U-87 Glioblastoma Cells  
Summit Middle Charter School Boulder

### **Junior Division Earth & Space Sciences**

Second Place

Noah Tice 8th grade  
Does Elevation Affect the Amount of Alpha and Beta  
Radiation in the Air?  
Summit Middle Charter School Boulder

### **Senior Division Earth & Space Sciences**

First Place

Natalie Pujet 11th grade  
Modeling Triton's Seasonal Atmospheric Change:  
Applications of the VT3D Model to Triton  
Fairview High School Boulder

Second Place

Allison Inge 12th grade  
Langley Nakari 12th grade  
Characterizing the Altitude and Variability of the Martian  
Mesopause Over the MAVEN Mission  
Monarch High School Louisville

### **Senior Division Engineering**

Second Place

Kelly Yang 9th grade  
Under Pressure: Piezoresistive Pressure Sensors for  
Electronic Skin  
Fairview High School Boulder

Honorable Mention

Zachary Weiner 12th grade  
Zachary Porter 12th grade  
Developing an Energy Efficient Home for Climate Control  
Using Passive Solar and Wind Technology  
Nederland Middle Senior High School Nederland

### **Senior Division Mathematics & Computer Sciences**

First Place

Morgan Holien 12th grade  
Attempting to Define Tetration of Non-Integer Heights  
Monarch High School Louisville

### **Senior Division Microbiology & Molecular Biology**

First Place

Margaret Arthur 10th grade  
Ab-GAN: A Novel Approach to Create 3D Antibody  
Paratope Models Using Antigen Epitopes  
Fairview High School Boulder

<p><b><u>Senior Division Medicine &amp; Health</u></b></p> <p>Third Place Daniel Lin 11th grade Discovering Biomarkers for Breast Cancer Subtypes with Gene Expression Data Using Machine Learning Fairview High School Boulder</p> <p><b><u>Senior Division Physics</u></b></p> <p>Second Place Skylar Abernathey 12th grade Bernard Coleman 12th grade Noah Rand 12th grade Electromagnetically Driven Surgical Catheters and the Physics That Guides Them Monarch High School Louisville</p>	<p>Second Place Clara Kursinski 12th grade Analyzing Ancient Mitochondrial DNA in the Caribbean to Infer Human Migration Patterns Fairview High School Boulder</p>
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## 2022 Colorado Science and Engineering Fair Special Awards Press Release

<p><b><u>Ralph Desch Memorial Technical Writing Award</u></b></p> <p>Henry Westfall 11th grade certificate Fairview High School Boulder Investigating Political Polarization Through Human Experiments and Agent-Based Simulation</p> <p>Daniel Lin 11th grade certificate Fairview High School Boulder Discovering Biomarkers for Breast Cancer Subtypes with Gene Expression Data Using Machine Learning</p> <p><b><u>Steven Chu Award</u></b></p> <p>Chayton Feaux 8th grade certificate, \$50 Peak to Peak Charter School Lafayette Ballistics Testing: The Effect of Temperature on Projectile Penetration Into 10% Ballistics Gel</p> <p><b><u>Wangari Muta Maathai Award</u></b></p> <p>Elton Cao 10th grade certificate, \$150 Fairview High School Boulder The Effect of Oil and Gas Production on Tropospheric Ozone and Air Quality Emissions</p>	<p><b><u>State of Colorado Division of Reclamation, Mining &amp; Safety DRMS Outstanding Science Exhibit</u></b></p> <p>Natalie Pujet 11th grade \$1,000 scholarship to attend CSM, renewable for up to 3 additional years for use towards an undergraduate degree Fairview High School Boulder Modeling Triton’s Seasonal Atmospheric Change: Applications of the VT3D Model to Triton</p> <p>Anastasia Diener 11th grade \$1,000 scholarship to attend CSM, renewable for up to 3 additional years for use towards an undergraduate degree Fairview High School Boulder Sequentially Photostiffening a Hydrogel: Redshifting Tetrazoles for Long-Wavelength Activation</p> <p>Henry Westfall 11th grade \$1,000 scholarship to attend CSM, renewable for up to 3 additional years for use towards an undergraduate degree Fairview High School Boulder Investigating Political Polarization Through Human Experiments and Agent-Based Simulation</p> <p><b><u>National Society of Professional Engineers of Colorado Scholarship Award</u></b></p> <p>Zachary Weiner 12th grade Zachary Porter 12th grade \$1,000 scholarship to a Colorado Engineering College of student's choice</p>
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**American Industrial Hygiene Association Rocky Mountain Section Excellence in Protection of Occupational Health and Safety**

Noah Tice 8th grade  
certificate, \$150  
Summit Middle Charter School Boulder  
Does Elevation Affect the Amount of Alpha and Beta Radiation in the Air?

**American Institute of Aeronautics & Astronautics Rocky Mountain Section AIAA Aeronautics and Astronautics Award**

Natalie Pujet 11th grade  
certificate, Arduino Starter kits (\$100 value)  
Fairview High School Boulder  
Modeling Triton's Seasonal Atmospheric Change:  
Applications of the VT3D Model to Triton

**American Statistical Association, Colorado/Wyoming Chapter David Young Memorial Award**

Margaret Arthur 10th grade  
certificate, \$200, student membership in the American Statistical Association, acknowledgment at chapter spring meeting and on chapter web site (both divisions)  
Fairview High School Boulder  
Ab-GAN: A Novel Approach to Create 3D Antibody Paratope Models Using Antigen Epitopes

Amrita Saini 10th grade  
certificate, \$200, student membership in the American Statistical Association, acknowledgment at chapter spring meeting and on chapter web site (both divisions)  
Peak to Peak Charter School Lafayette  
Using Algae to Make Photosynthetic & Bioluminescent Textiles for Sustainable Lighting & CO2 Removal

**Colorado Scientific Society Excellence in Earth Science Award**

Elton Cao 10th grade  
certificate, \$100 F  
Fairview High School Boulder  
The Effect of Oil and Gas Production on Tropospheric Ozone and Air Quality Emissions

**Department of Commerce, Boulder Laboratories Award for Excellence in Science and Engineering**

Allison Inge 12th grade  
Langley Nakari 12th grade  
plaque, summer internship at the DOC labs in Boulder  
Monarch High School Louisville  
Characterizing the Altitude and Variability of the Martian

Nederland Middle Senior High School Nederland  
Developing an Energy Efficient Home for Climate Control Using Passive Solar and Wind Technolog

Lila Mosberger 8th grade  
certificate, nomination to the 2022 Broadcom MASTERS competition  
Summit Middle Charter School Boulder  
How Ethanol Affects U-87 Glioblastoma Cells

Noah Tice 8th grade  
certificate, nomination to the 2022 Broadcom MASTERS competition  
Summit Middle Charter School Boulder  
Does Elevation Affect the Amount of Alpha and Beta Radiation in the Air?

Saatwik Das 8th grade  
certificate, nomination to the 2022 Broadcom MASTERS competition  
Peak to Peak Charter School Lafayette  
Magnetic Levitation

Natalie Pujet 11th grade  
certificate  
Fairview High School Boulder  
Modeling Triton's Seasonal Atmospheric Change:  
Applications of the VT3D Model to Triton

Elton Cao 10th grade  
certificate  
Fairview High School Boulder  
The Effect of Oil and Gas Production on Tropospheric Ozone and Air Quality Emissions

**Mu Alpha Theta Outstanding Achievement in Mathematics**

Morgan Holien 12th grade  
certificate  
Monarch High School Louisville  
Attempting to Define Tetration of Non-Integer Heights

**United States Agency for International Development USAID Science Champion Award**

Amrita Saini 10th grade  
certificate  
Peak to Peak Charter School Lafayette  
Using Algae to Make Photosynthetic & Bioluminescent Textiles for Sustainable Lighting & CO2 Removal

**National Geographic Society That's Geography - Cultivating Empathy for the Earth Award**

Amrita Saini 10th grade

<p>Mesopause Over the MAVEN Mission</p> <p><b><u>Lockheed Martin Lockheed Martin Aerospace Award</u></b></p> <p>Allison Inge 12th grade Langley Nakari 12th grade certificate, \$350 Monarch High School Louisville Characterizing the Altitude and Variability of the Martian Mesopause Over the MAVEN Mission</p> <p><b><u>Society of Women Engineers Rocky Mountain Section SWE Award</u></b></p> <p>Amrita Saini 10th grade certificate, \$75 Peak to Peak Charter School Lafayette Using Algae to Make Photosynthetic &amp; Bioluminescent Textiles for Sustainable Lighting &amp; CO2 Removal</p>	<p>certificate, \$100 (response required from winner to process) Peak to Peak Charter School Lafayette Using Algae to Make Photosynthetic &amp; Bioluminescent Textiles for Sustainable Lighting &amp; CO2 Removal</p> <p><b><u>SACNAS, Colorado State University Chapter SACNAS CSU Rising Young Scientist Award</u></b></p> <p>Amrita Saini 10th grade certificate, \$50 Peak to Peak Charter School Lafayette Using Algae to Make Photosynthetic &amp; Bioluminescent Textiles for Sustainable Lighting &amp; CO2 Removal</p>
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## 2022 Teacher Awards

<p><b><u>Colorado Science &amp; Engineering Fair Doug Steward Memorial Award</u></b></p> <p>Boone Starr certificate \$75 Flagstaff Academy Longmont</p>	<p><b><u>Longmont Lockheed Martin CSEF Teacher of the Year Award</u></b></p> <p>Boone Starr certificate, plaque, \$3,000 grant to the school Flagstaff Academy Longmont</p>
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## 2022 Pioneers of Science Awards

### **Dian Fossey Award**

Lakshmi Thanikasalam 7th grade  
certificate, \$50  
Flagstaff Academy Longmont  
Capillary Action: Investigation and Empirical Modeling

## 2022 Military Awards

### **United States Navy and Marine Corps Office of Naval Research Award**

Eli Krause 8th grade  
certificate, ONR medallion  
Flagstaff Academy Longmont  
Learn Better With Games

## 2022 Colorado Organizational Awards

<p><b><u>Colorado Mineral Society Best Earth Science Award</u></b></p> <p>Noah Tice 8th grade certificate, \$35, mineral specimen, book Summit Middle Charter School Boulder Does Elevation Affect the Amount of Alpha and Beta Radiation in the Air?</p> <p><b><u>Colorado Mycological Society Excellence in Mycological Research Award</u></b></p> <p>Anastasia Diener 11th grade certificate, \$75 Fairview High School Boulder Sequentially Photo Stiffening a Hydrogel: Redshifting Tetrazoles for Long-Wavelength Activation</p> <p><b><u>Colorado's Electric Cooperatives The Colorado EnergyWise Award</u></b></p> <p>Saatwik Das 8th grade certificate, \$175 Peak to Peak Charter School Lafayette Magnetic Levitation</p> <p>Alec Mallinger 12th grade Oliver Schmitz 12th grade Davis Cutforth 12th grade certificate, \$175 Centaurus High School Lafayette Hydrogen Fuel Cell Vehicle/Station</p>	<p><b><u>Rocky Mountain Association of Geologists Excellence in Earth Science Award</u></b></p> <p>Elton Cao 10th grade certificate, \$200 Fairview High School Boulder The Effect of Oil and Gas Production on Tropospheric Ozone and Air Quality Emissions</p> <p><b><u>Rocky Mountain Water Environment Association Water Research Award</u></b></p> <p>Amrita Saini 10th grade certificate, \$50 Peak to Peak Charter School Lafayette Using Algae to Make Photosynthetic &amp; Bioluminescent Textiles for Sustainable Lighting &amp; CO2 Removal</p> <p>Kelly Yang 9th grade certificate, \$100 Fairview High School Boulder Under Pressure: Piezoresistive Pressure Sensors for Electronic Skin</p>
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## 2022 Society for Science – National Awards

<p><b><u>Broadcom Foundation Broadcom MASTERS Nomination</u></b></p> <p>Julia Ropp 8th grade certificate, nomination to the 2022 Broadcom MASTERS competition Summit Middle Charter School Boulder The Power of Positivity</p> <p>Sophia Zhang 8th grade certificate, nomination to the 2022 Broadcom MASTERS competition Summit Middle Charter School Boulder</p>	<p><b><u>Regeneron Regeneron Biomedical Science Award</u></b></p> <p>Kelly Yang 9th grade certificate, \$500 (response required from winner to process) Fairview High School Boulder Under Pressure: Piezoresistive Pressure Sensors for Electronic Skin</p> <p><b><u>Society for In Vitro Biology</u></b></p> <p>Daniel Lin 11th grade</p>
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<p>A Small Bond Breaking Breaks Boundaries Toward the Solution to Plastic Pollution</p> <p>Eli Krause 8th grade certificate, nomination to the 2022 Broadcom MASTERS competition Flagstaff Academy Longmont Learn Better With Games</p>	<p>certificate Fairview High School Boulder Discovering Biomarkers for Breast Cancer Subtypes with Gene Expression Data Using Machine Learning</p>
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Special thanks goes to all of the contributors and sponsors of the 2022 CSEF for their financial and in-kind support of Colorado’s future scientists. This year’s top sponsors (\$2,500 or more) included Bayswater Exploration & Production, Broadcom Foundation, Colorado State University, Verizon, Keysight Technologies, Lockheed Martin, NOAA, Colorado Springs Pediatric Dentistry and Society of Petroleum Engineers, Denver Section.

For a complete list of all of the 2022 CSEF participants, sponsors, Colorado’s Intel ISEF delegates and other CSEF details, please visit the CSEF website at [www.csef.colostate.edu](http://www.csef.colostate.edu).

The Colorado Science and Engineering Fair (CSEF) is an independent, nonprofit corporation. Thanks to the support of generous corporations, foundations, government agencies, and donors who believe in the importance of science education, the CSEF has served Colorado and its students for 67 years.